



# *Impacts of Fire on Cultural Resources*



# A Cultural Resource Is...

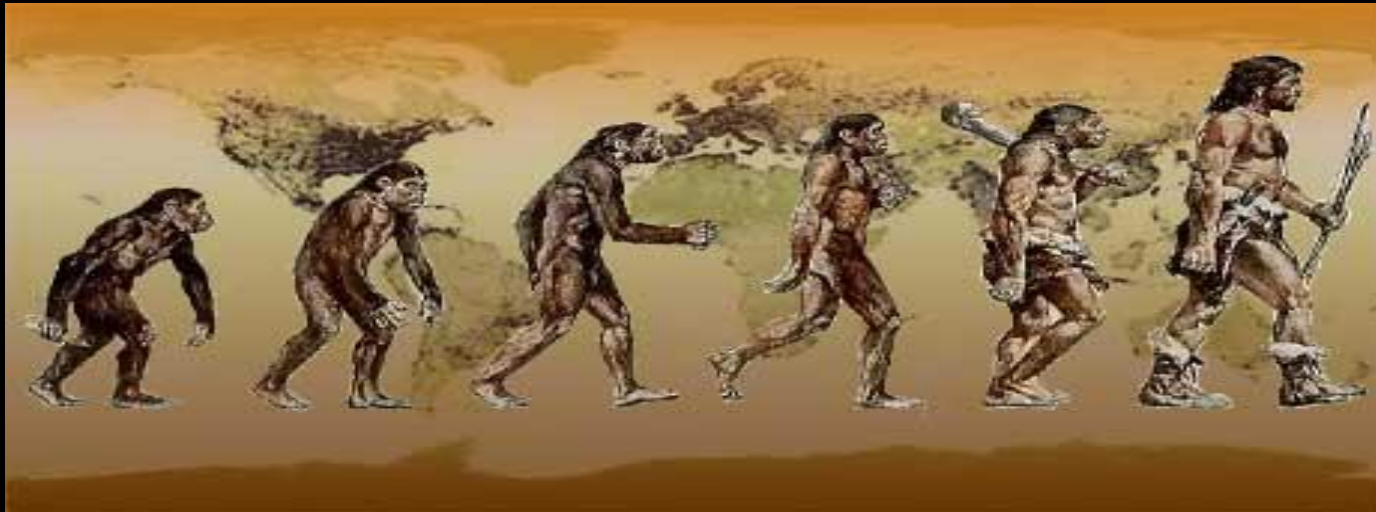
- *A fragile and nonrenewable remain of human activity.*

# We'll Talk About...

- What Constitutes a Cultural Resource
- Fire's Effects
- Impacts of Burn Preparation / Suppression
- Management Considerations

# Broad Scope

- Time Periods
  - Prehistoric
  - Historic
  - Contemporary



# Global and Temporal Perspective

- Australia / Africa
  - 40,000 years of continuous occupation
- Europe
  - 6,000 years of landscape alteration





# Classes of Cultural Remnants

- Artifacts
- Traces
- Sites



Artifact = *Functional, deliberate object*



# Traces = *Evidence of use or alteration*

- Accidental

- Remains



• places where food remains, such as broken or worn out tools were thrown



# Sites

- Spiritual sites
- Traditional use areas
- Battlegrounds
- Trails
- Cabins
- Mines
- Camps



# Potential for Fire Damage

- Heating
- Combustion
- Smoke
- Char
- Rapid temperature change



# Physical and Chemical Damage

- Organic
  - Consumption
  - Structural Breakdown
    - Pollen, bones
  - Charring



# Mitigating Factors

- Soil depth
- Soil moisture
- Fuel load
- Sensitivity to heat
- Duration of heating
- Peak maximum temperature





# Impacts on Dating Techniques

- Tree Rings
- Fire Scars
- Radiocarbon
- Thermoluminescence
- Obsidian hydration
- Archaeo-magnetic
- Cation-ratio





# Erosion, Exposure and Looting

- Soil erosion = loss of archaeological data.
- Damage from rain, new drainages
- Physical damage from falling snags
- Increased visibility = vulnerability to vandalism and illegal collection.



# Burn Preparation and Suppression

→ Impacts are often more severe than fire itself

- Fireline construction
- Water and Retardant
- Heliports, Basecamps
- Vehicular traffic
- Mopup
- Erosion control



# Damage Prevention

- Pre-fire Planning
  - Identify and map areas of concern
  - Include map in fire management plans
- During Fire
  - Cultural Resource Specialist on-site
  - Provide IC with resource map
  - Inform crews about what to look for
- Post-fire Assessment
  - Track effects over time
  - Before/after experiments



# Management Issues

- Is the effect of fire on materials important?
- Is the potential impact of prescribed fire acceptable relative to wildfire threats?
- Has the area burned routinely in the past?
- Is fire needed to maintain the cultural site?
- Can the prescribed fire plan be modified?
  - Location, dates, fire behavior

# Protection Measures

- Reduce fuels near vulnerable sites
- Create fire breaks (carefully!)
- Cover structures: foam, water, wrap
- Use low intensity fires.
- Use fast spreading fires where residence time is an issue.
- Reduce hazard trees near structures





# Why is Fire an Issue Now?

- Cumulative information loss
- Changes in fuel loads
- Intense management practices
- Advanced aging techniques
- More people desiring artifacts
- Recent laws and regulations



# Laws and Regulations

- Antiquities Act – 1906
- Historic Sites Act – 1935
- National Historical Preservation Act – 1966
- National Environmental Policy Act – 1969
- Archaeological & Historic Preservation Act – 1974
- Archaeological Resources Protection Act - 1979
- Native American Graves Protection Act - 1990

# Every Site is Unique

- Unique mix of historic and prehistoric cultures with different artifacts.
- Unique fuel characteristics that exhibit different fire behavior.
- In some cases, fire can offer some archaeological opportunities.
- In all cases, resource knowledge is critical to avoid damage.



# In conclusion

1. List cultural resource concerns related to fire operations.
  - a. What might be damaged?
  - b. Where should you avoid putting crews or bulldozers?
  - c. Are there any areas that must be protected from fire?
2. What artifacts or cultural traces might you expect to find?
  - a. Consider different cultural periods, prehistoric and historic
  - b. Artifacts, traces, alterations
3. What are the likely effects of fire on each?
  - a. Consumption
  - b. Erosion
  - c. Exposure
  - d. Breakdown or alteration